

CoolMOS Power MOSFET in ECO-PAC 2

N-Channel Enhancement Mode

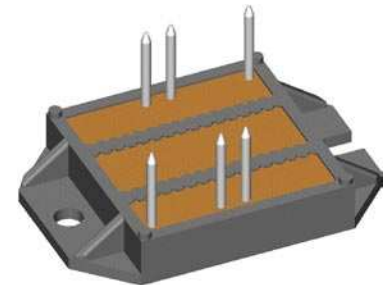
Low R_{DSon} , High V_{DSS} MOSFET

Package with Electrically Isolated Base

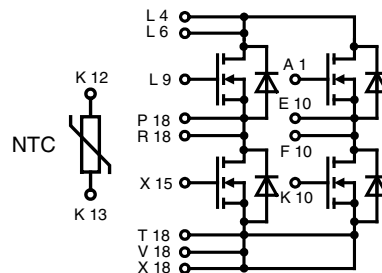
Preliminary data

$$\begin{aligned} I_{D25} &= 38 \text{ A} \\ V_{DSS} &= 600 \text{ V} \\ R_{DSon} &= 70 \text{ m}\Omega \end{aligned}$$

COOLMOS¹⁾
Power Semiconductors



Pin arrangement see outlines



MOSFET			
Symbol	Conditions	Maximum Ratings	
V_{DSS}	$T_{VJ} = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
V_{GS}		± 20	V
I_{D25}	$T_C = 25^\circ\text{C}$	38	A
I_{D90}	$T_C = 90^\circ\text{C}$	25	A
dI/dt	$V_{DS} < V_{DSS}$; $I_F \leq 50 \text{ A}$; $ di_F/dt \leq 200 \text{ A}/\mu\text{s}$ $T_{VJ} = 150^\circ\text{C}$	6	V/ns
E_{AS}	$I_D = 10 \text{ A}$; $L = 36 \text{ mH}$; $T_C = 25^\circ\text{C}$	1.8	J
E_{AR}	$I_D = 20 \text{ A}$; $L = 5 \text{ mH}$; $T_C = 25^\circ\text{C}$	1	mJ

Symbol	Conditions	Characteristic Values			
		$(T_{VJ} = 25^\circ\text{C}, \text{ unless otherwise specified})$			
		min.	typ.	max.	
R_{DSon}	$V_{GS} = 10 \text{ V}$; $I_D = I_{D90}$			70	m Ω
$V_{GS(th)}$	$V_{DS} = 20 \text{ V}$; $I_D = 3 \text{ mA}$	3.5		5.5	V
I_{DSS}	$V_{DS} = V_{DSS}$; $V_{GS} = 0 \text{ V}$; $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		60	25	μA μA
I_{GSS}	$V_{GS} = \pm 20 \text{ V}$; $V_{DS} = 0 \text{ V}$			100	nA
Q_g Q_{gs} Q_{gd}	$V_{GS} = 10 \text{ V}$; $V_{DS} = 350 \text{ V}$; $I_D = 50 \text{ A}$		220 55 125		nC nC nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	$V_{GS} = 10 \text{ V}$; $V_{DS} = 380 \text{ V}$ $I_D = 25 \text{ A}$; $R_G = 1.8 \Omega$		30 95 100 10		ns ns ns ns
R_{thJC}	per MOSFET			0.45	K/W

Data according to IEC 60747 refer to a single diode or transistor unless otherwise stated

Applications

- ECO-PAC 2 with DCB Base
 - Electrical isolation towards the heatsink
 - Low coupling capacitance to the heatsink for reduced EMI
 - High power dissipation
 - High temperature cycling capability of chip on DCB
 - solderable pins for DCB mounting
- fast CoolMOS power MOSFET
 - High blocking capability
 - Low on resistance
 - Avalanche rated for unclamped inductive switching (UIS)
 - Low thermal resistance due to reduced chip thickness
- Enhanced total power density

Applications

- Switched mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)
- Power factor correction (PFC)
- Welding
- Inductive heating

¹⁾ CoolMOS is a trademark of Infineon Technologies AG.

Source-Drain Diode

Symbol	Conditions	Characteristic Values			
		(T _{VJ} = 25°C, unless otherwise specified)			
		min.	typ.	max.	
I _S	Inverse diode forward current			47	A
I _{SM}	Inverse diode direct current pulsed			141	A
V _{SD}	Inverse diode forward voltage V _{GS} = 0 V; I _F = I _S		1	1.2	V
t _{rr}	$\left. \begin{array}{l} V_R = 350 \text{ V} \\ I_F = I_S \\ di_F/dt = 100 \text{ A}/\mu\text{s} \end{array} \right\}$		580		ns
Q _{rr}			23		μC
I _{RM}			73		A
di _{rr} /dt			900		A/μs

Temperature Sensor NTC

Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
R ₂₅	T = 25°C	4.75	5.0	5.25	kΩ
B _{25/50}			3375		K

Module

Symbol	Conditions	Maximum Ratings	
T _{VJ}		-40...+150	°C
T _{stg}		-40...+125	°C
V _{ISOL}	I _{ISOL} ≤ 1 mA; 50/60 Hz; t = 1 s	3600	V~
M _d	mounting torque (M4)	1.5 - 2.0 14 - 18	Nm lb.in
a	Max. allowable acceleration	50	m/s ²

Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
d _S	Creepage distance on surface (pin to heatsink)	11.2			mm
d _A	Strike distance in air (pin to heatsink)	11.2			mm
Weight			24		g

Technical drawing of a mechanical part, showing a side view and a detail view of a corner.

Side View Dimensions:

- Overall width: $31,6 \pm 0,2$
- Overall height: $34,3 \pm 0,2$
- Top horizontal dimensions: $34,3 \pm 0,2$, $21,7 \pm 0,2$, $18,1 \pm 0,2$, $8,7 \pm 0,2$
- Right side vertical dimensions: $3,1 \pm 0,2$, $7,8 \pm 0,2$, $12 \pm 0,2$, $25,6 \pm 0,2$, $26,6 \pm 0,2$, $31,6 \pm 0,1$
- Bottom horizontal dimensions: $27,6 \pm 0,2$, $31,2 \pm 0,2$
- Left side vertical dimensions: $15,8 \pm 0,2$
- Bottom left corner: $\phi 4,3 \pm 0,2$, 45°
- Internal features: 18 holes (A-X) and 18 holes (1-18) are indicated.

Detail View Dimensions:

- Overall width: $51 \pm 0,2$
- Overall height: $20,3 \pm 0,2$
- Top horizontal dimensions: $1,5$, 1
- Left side vertical dimensions: $8,3$
- Right side vertical dimensions: 1 , 2 , 8
- Bottom horizontal dimensions: 43
- Bottom left corner: 36°